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Higgs Physics at Muon Collider with detailed detector simulation

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Muon collisions at multi-TeV center of mass energies are ideal for studying Higgs boson properties. At these energies the production rates will allow precise measurements of its couplings to fermions and bosons. In addition the double Higgs boson production rate could be sufficiently high to directly measure the parameters of trilinear self-couplings, giving access to the determination of the Higgs potential.

This contribution aims to give an overview of the results that have been obtained so far on Higgs couplings by studying the $\mu^+\mu^- \rightarrow H(b\bar{b})\nu\bar{\nu}$, $\mu^+\mu^- \rightarrow H(WW^*)\nu\bar{\nu}$ and $\mu^+\mu^- \rightarrow H(b\bar{b})H(b\bar{b})\nu\bar{\nu}$ processes. All the studies have been performed with a detailed simulation of the signal and physics background samples and by evaluating the effects of the beam-induced background on the detector performance.

Evaluations on Higgs boson couplings sensitivities and results on the uncertainty on double Higgs production cross section, together with the trilinear self-coupling, will be discussed at a center of mass energy of 3 TeV.

In-person participation

Yes

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